3.95/4.5

QUIZ #2

Name: _Kyle Ness_

- 40 Minutes, No materials allowed. (Number) indic...

X 1. For each, indicate where data comes from. Provide the type of addressing mode. Assume that [X] = 0200_{16}. **(0.4)**

   a) LDAA #$2D. _Immediate addressing. Data comes directly from program._
   b) LDAA $7C. _Direct addressing. Data comes from memory location 007C._
   c) LDAA $57BB. _Extended addressing. Data comes from memory location 57BB._
   d) LDAA $3F, X. _Indexed addressing. Data comes from memory location $023F_{16}$._

X 2. Calculate the value of the offset byte portion of the BEQ instruction. **(1)**

$0310 + 5b = 037B$ We want opposite ways so compliment 54.

$FF - 56 + 1 = \boxed{AA}$

0370	START	10	SBA
0371		27 ??	BEQ $031D
0373		97 50	STAA $50
0375	END	3E	WAI

X 3. Show how the JSR instruction can be replaced by a BSR instruction with appropriate offset. The op code for BSR is 8D. **(1)**

-0.5   BSR only takes 2 bytes so all program lines will be moved back by 1 so we want to Branch to location C15F.

$C15F - C104 = \underline{5B}$ $\boxed{8D\ 5B}$

C100	MAIN	96 A6	LDAA $A6
C102		BD C1 60	JSR $C160
C105		97 A7	STAA $A7
C107	END	3E	WAI
	:	:	:
	:	:	:
C160	SHIFT	44	LSRA
C161		44	LSRA
C162		39	RTS

X 4. When the MPU executes a (_JSR command_) it saves the (_PC contents_) on the (_Stack_), jumps to the (_Subroutine_), and executes the (_Code_). At the end of the (_Subroutine_) the (_RTS command_) causes the MPU to take the (_return address_) off the (_Stack_), place it back in the (_program counter_), and continue execution of the main program. **(1)**

return address

X 5. Describe two ways to halt execution of a program in MC68HC11. **(0.6)**

WAI command will halt the execution of a program.
-0.3 _Smashing the MC68HC11 with a hammer will halt execution as well._

X 6. Consider the following instruction sequence. Determine where the program will branch to for each of the following values of unsigned data in memory location 0050. **(1.5)**

-0.5 6B (a) 95. $C607 + D6 = \boxed{C6DD}$ •
-0.5 49 (b) B7. $C609 + 6B = \boxed{C674}$ •
-0.5 5F (c) E1. $C607 + D6 = \boxed{C6DD}$

C600	START	96 50	LDAA $50
C602		43	COMA
C603		81 48	CMPA #$48
C605		22 D6	BHI $????
C607		27 55	BEQ $????
C609		20 6B	BRA $????

THE END

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